Fast Track Troubleshooting

Publication # tsRM257AB Revision Date 03/30/2011

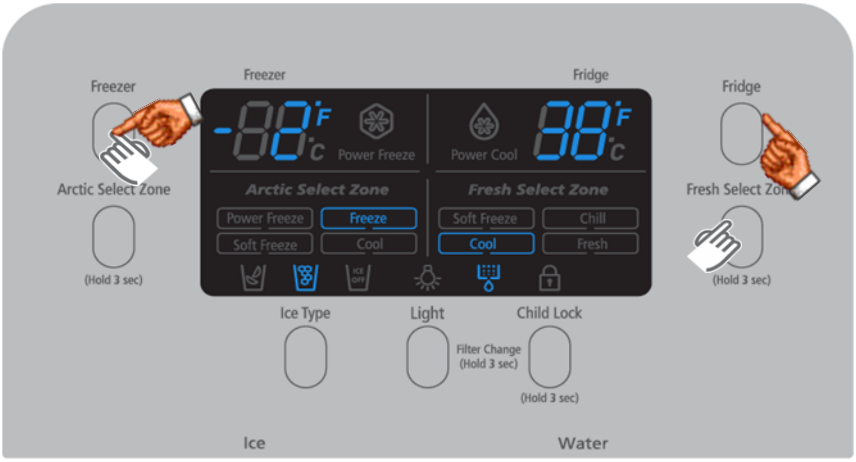
Models Covered:
RM257ABBP/XAA,
RM257ABPN/XAA,
RM257ABRS/XAA

4 Door Refrigeration

IMPORTANT SAFETY NOTICE – "For Technicians Only" This service data sheet is intended for use by persons having electrical, electronic, and mechanical experience and knowledge at a level generally considered acceptable in the appliance repair trade. Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible, nor assume any liability for injury or damage of any kind arising from the use of this data sheet.

Self Diagnosis: Press both buttons (Freezer– Fridge) *simultaneously* (No sound when both buttons are pressed at the same time) 'til the display quits blinking and beeps, 8-12 seconds, then release and read Fault Codes.
This will also cancel the Fault Mode created by self-diagnosis at power up.

Forced Mode: Press both buttons (Freezer– Fresh Select Zone) *simultaneously* (No sound when both buttons are pressed at the same time) 'til it beeps and goes blank, 8-12 seconds



Wait 5 seconds between button pushes

3600RPM

Press Freezer button one time at the Test Mode to Force Compressor High Speed Run, measure fan and Compressor voltages at main PCB

2450RPM

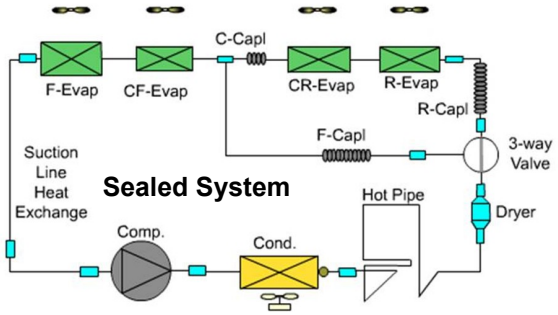
Press Freezer button a second time to Force Mid Speed Run

2200RPM

Press Freezer button a third time to Force Low Speed Run

Press Freezer button a forth time to Force Defrost of Fridge & Freezer, measure defrost voltage at main PCB

Refrigerant Charge
R134a 7.76 oz.



Component Value Chart

Component	Resistance	Wattage	Voltage
Freezer Defrost Heater	72Ω	200	120vac
Fridge Defrost Heater	180Ω	80	120vac
CF Defrost Heater	144Ω	100	120vac
CR Defrost Heater	180Ω	80	120vac
F Drain Tube/Heater	2880Ω	5	120vac
R Drain Tube/Heater	2880Ω	5	120vac
Dispenser Heater	2880Ω	5	120vac
Water Tank Heater	29Ω	5	12vdc
Fill Tube Heater	29Ω	5	12vdc
Sensors	2.5kΩ-89kΩ	N/A	1~4.5vdc
Fans	N/A	N/A	7~12vdc

Sales Mode, No Compressor Operation: Press Energy Saver & Freezer temp buttons simultaneously for 3 sec (you will hear a "Ding Dong") to remove or put into Sales Mode. When in the Sales Mode the Display will show "OF" "OF" Removing power will not cancel this mode.

SUPPORT INFORMATION
Training — Plus One **http://my.plus1solutions.net/clientPortals/samsung/**
Help — GSPN **http://service.samsungportal.com/**
Samsung Product Support TV **http://support-us.samsung.com/spstv/howto.jsp**
Customer information videos and chat programs. Programs for Fridges, Laundry, Ranges & D/W

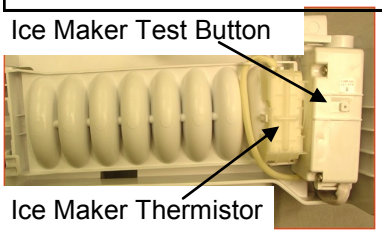
DC FAN MOTORS

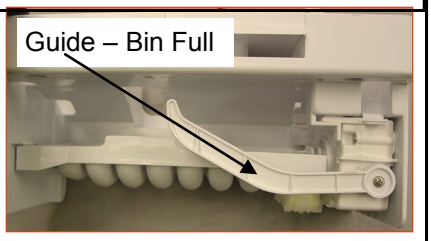
Brushless DC Fan motors are used to save energy. The fans operate at two speeds. Fan speed information is read by the Main PCB. If the fan speed exceeds 600 RPM or the speed is too slow, or stopped the fan drive circuit is disabled, After 10 seconds the circuit tries again with 3 seconds of DC voltage. If the fan continues this activity for 5 cycles, 10 seconds off 3 seconds on, the fan drive circuit is disabled for 10 minutes.

TO TEST THE FAN CIRCUIT VOLTAGE.
Power off and back on to check the DC voltage to the motor, wait from 10 to 60 seconds for the fan voltage to kick in, and then check fan voltage, the average reading is 9 VDC. If you get 3 seconds of voltage every 10 seconds for the 5 fan power up cycles, then the Main PCB is good.

NOTE: You may need to put unit in FORCED FREEZE mode to activate the fans/compressor.
If the fan blade is blocked by ice, then defrost and check the motor again, after removing power from the unit.
If the evaporator is ice blocked and thus blocking the air flow, the fan will over RPM and it is stopped. Remove ice and check the motor again. If everything is clear around the fan blade then the motor would be at fault. Continuous fan errors will be displayed on the front panel display. **PLEASE NOTE:** The door switches control the evaporator fan motors. Have them closed to test the motors. Delay time 10 – 60 seconds.

FLEX TRAY Ice Makers
When the initial power is applied, the ice tray will stand by for 2 hours. After the 2-hour standby time, the Ice Maker Sensor will check the temperature, when it is lower than 1.5°F for more than 5 minutes, it will do a harvest, with or without ice in the tray, then fill with water. 58 minutes after water is supplied to the Ice Tray, the Ice Maker Sensor temperature will be checked. When the Ice Maker Sensor maintains lower than 1.5°F for 5 minutes, it completes the harvest (if the ice bin is not sensed as full).
Thermistor senses temperature to determine water fill on newer units
Filling the tray
After the water fill is completed, the ice maker sensor will evaluate the water volume one and a half minutes later. When it detects no or low water level, it will add more water. First supply time will be 1.5 sec, next one will be 1 sec and the last will be 2 sec.





Shattered Ice – Flex Tray

When all ice shatters, it's because of a bad tray or ice cube temp that is too cold (lower than -5 degrees). In some areas, there are water issues that can also cause shattered cubes. The temp in the freezer should not have any effect on this issue, as long as it's below 1.5 degrees F, as a properly installed sensor will not read the freezer temp, only the water/ice temp.

Check the Ice tray for defects in the plastic. Ice that is too cold will shatter during harvest. This can be from the (1) sensor not reading the correct temp (2) or the sensor not mounted correctly (3). By programming the icemaker offset value to a lower number (4), the board not understanding the reading.

To check the sensor, you must check the tray temp (not air temp) and compare it to the sensor reading. The sensor should read 3.7 volts at the main board connector when the cube temperature is 1 degree. After the fill, the sensor will read water temp 1.5 to 2.2 volts.

Please note, some shattering is normal for a flex tray icemaker.

Temperature/Resistance/Voltage Chart for Refrigerators Sensors

Temp.	(Ω)	Volts		Temp.	(Ω)	Volts		Temp.	(Ω)	Volts		Temp.	(Ω)	Volts
-29.2°F	64227	4.326		1.4°F	28021	3.685		32.0°F	13290	2.853		62.6°F	6771	2.019
-27.4°F	61012	4.296		3.2°F	26760	3.64		33.8°F	12749	2.802		64.4°F	6521	1.974
-25.6°F	57977	4.264		5.0°F	25562	3.594		35.6 °F	12233	2.751		66.2°F	6281	1.929
-23.8°F	55112	4.232		6.8°F	24425	3.548		37.4 °F	11741	2.7		68.0°F	6052	1.885
-22.0°F	52406	4.199		8.6°F	23345	3.501		39.2 °F	11271	2.649		69.8°F	5832	1.842
-20.2°F	49848	4.165		10.4°F	22320	3.453		41.0°F	10823	2.599		71.6°F	5621	1.799
-18.4°F	47431	4.129		12.2°F	21345	3.405		42.8°F	10395	2.548		75.2°F	5225	1.716
-16.6°F	45146	4.093		14.0°F	20418	3.356		44.6°F	9986	2.498		77.0°F	5000	1.675
-14.8°F	42984	4.056		15.8°F	19537	3.307		46.4°F	9596	2.449		78.8°F	4861	1.636
-13.0°F	40938	4.018		17.6°F	18698	3.258		48.2°F	9223	2.399		80.6°F	4690	1.596
-11.2°F	39002	3.98		19.4°F	17901	3.208		50.0°F	8867	2.35		86.0°F	4218	1.483
-9.4°F	37169	3.94		21.2°F	17142	3.158		51.8°F	8526	2.301		87.8°F	4072	1.447
-7.6°F	35433	3.899		23.0°F	16419	3.107		53.6°F	8200	2.253		89.6°F	3933	1.412
-5.8°F	33788	3.858		24.8°F	15731	3.057		55.4°F	7888	2.205		91.4°F	3799	1.377
-4.0°F	32230	3.816		26.6°F	15076	3.006		57.2°F	7590	2.158		95.0°F	3547	1.309
-2.2°F	30752	3.773		28.4°F	14452	2.955		59.0°F	7305	2.111		96.8°F	3428	1.277
-0.4°F	29350	3.729		30.2°F	13857	2.904		60.8°F	7032	2.064		100.4°F	3204	1.213

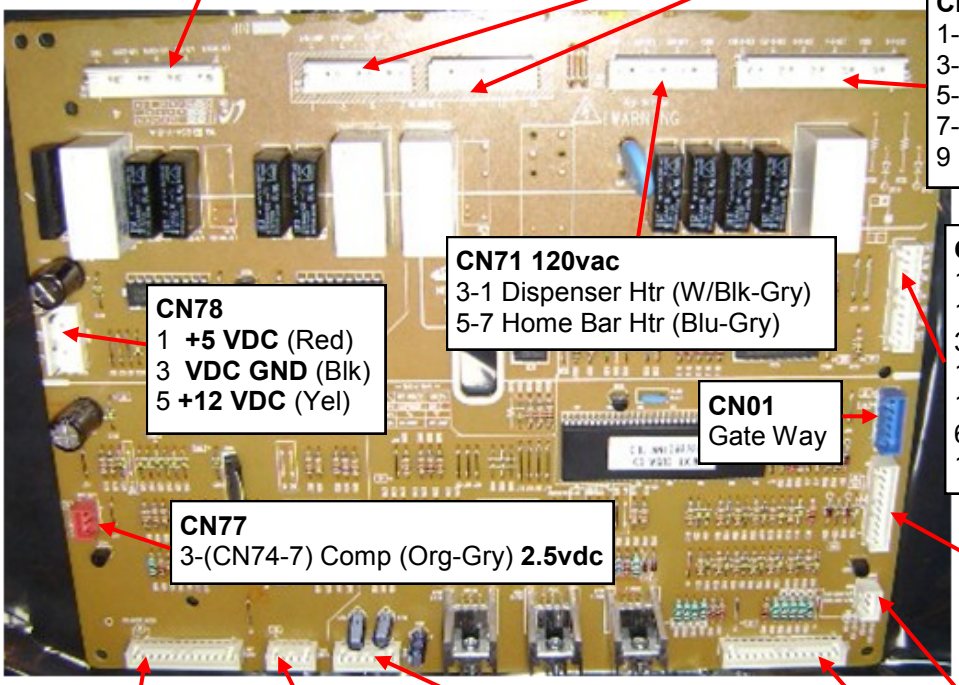
Samsung 'Refrigerator' Diagnostic Code Quick Guide			
Error Items	**LED**	**TROUBLE**	**TESTING**
I/M-SENSOR (R on Twin I/M units)		Ice Maker Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F	The voltage at MAIN PCB Sensor between 4.5V~1.0V
R-SENSOR		Refrigerator Room Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F.	The voltage at MAIN PCB Sensor between 4.5V~1.0V
DEFROST SENSOR OF R ROOM		Ref. Defrost Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F	The voltage at MAIN PCB Sensor between 4.5V~1.0V
R-FAN ERROR		This error indicates the Refrigerator Evap Fan is not spinning at the correct RPM or the fan feedback line is open.	Fan voltage at MAIN PCB shall be between 7V~12V
I/M FUNCTION ERROR(R on Twin I/M)		This error indicates the Ice tray has not returned to level after an ice harvest. The error is displayed after three failed attempts.	Replace I/M
COOL SELECT ZONE SENSOR		Cool Select Zone Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F	The voltage at MAIN PCB Sensor between 4.5V~1.0V
R-DEFROSTING ERROR		Refrigerator Room defrost heater- open or short-circuit, connector failure, or defective temperature fuse/bi-metal. Defrost on over 80 minutes	Disconnect defrost connector from PCB, check resistance
PANTRY-DAMPER-HEATER ERROR		Sensor system in Pantry Room errors	Disconnect heater connector from PCB, check resistance
CR-SENSOR 4-Door		CR Room Sensor Error- This can be an open or short-circuit, contact failure. Cause is also a temperature reading > 122°or < -58 ° F.	The voltage of MAIN PCB Sensor between 4.5V~1.0V
DEFROST SENSOR CR ROOM 4-Door		CR Room Defrost Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F.	The voltage at MAIN PCB Sensor between 4.5V~1.0V
DEFROST SENSOR OF CF ROOM 4-Door		CF Room Defrost Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F.	The voltage at MAIN PCB Sensor between 4.5V~1.0V
CR-DEFROSTING ERROR 4-Door		CR Compartment Defrosting heater- open or short-circuit, connector failure, or defective temperature fuse/bi-metal. Defrost on for over 80 minutes	Disconnect heater connector from PCB, check resistance
CF-DEFROSTING ERROR 4-Door		CF Compartment defrosting heater-open or short-circuit, connector failure, or defective temperature fuse/bi-metal. Defrost on for over 80 minutes	Disconnect heater connector from PCB, check resistance
WATER TANK HEATER ERROR		Error is displayed when the water reservoir tank heater is open or shorted	Disconnect heater connector from PCB, check resistance
EXT-SENSOR		Ambient Temp. Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F	The voltage at MAIN PCB Sensor between 4.5V~1.0V
F-SENSOR		Freezer Compartment Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F	The voltage at MAIN PCB Sensor between 4.5V~1.0V
F-DEF-SENSOR		Freezer Room Defrost Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F	The voltage at MAIN PCB Sensor between 4.5V~1.0V
F-FAN ERROR		This error indicates the Freezer Evap. Fan is not spinning at the correct RPM or the fan feedback line is open.	Fan voltage at MAIN PCB shall be between 7V~12V
C-FAN ERROR		This error indicates the Condenser Fan is not spinning at the correct RPM or the fan feedback line is open.	Fan voltage at MAIN PCB shall be between 7V~12V
CF-SENSOR 4-Door		CF Room Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122°or < -58 ° F	The voltage at MAIN PCB Sensor between 4.5V~1.0V
F-DEFROSTING ERROR		Freezer defrosting heater- open or short-circuit, connector failure, or defective temperature fuse/bi-metal. Defrost on for over 80 minutes	Disconnect defrost connector from PCB, check resistance
CF-FAN ERROR 4-Door		This error indicates the CF Compartment Evap. Fan is not spinning at the correct RPM or the fan feedback line is open.	Fan voltage at MAIN PCB shall be between 7V~12V
CR-FAN ERROR 4-Door		This error indicates the CR Compartment Evap. Fan is not spinning at the correct RPM or the fan feedback line is open.	Fan voltage at MAIN PCB shall be between 7V~12V
ICE PIPE HEATER ERROR		Error is displayed when the ice maker fill pipe heater is open or shorted.	Replace Fill Tube Ass'y
Uart ERROR COMMUNICATION		This error is not applicable, if the error is detected during diagnostic testing please ignore it.	No Repair Necessary
L?M ERROR COMMUNICATION		Communication error within the Main PCB	Replace main PCB
P?M ERROR COMMUNICATION		Communication between the Main PCB and Keypad	Check wiring in door & cabinet, Panel PCB, Main PCB

CN= Connector # for measuring voltages; () means go to connector #, pin # shown in () for voltage common.
CN30 Sensors & Switches Component Name
4-(CN76-1) F Def Sensor (Org-Gry) 2.3~4.2vdc
Voltage on operating component
Pin #s & wire colors on each connector to measure voltages

Key To Read PCB Layout

CN73 120vac
1-(CN70-9) Cube Mtr (Yel–Red)
3-(CN70-9) Auger Mtr (Pnk–Red)
5-(CN70-9) Water Solenoid/Valve (W/Blk–Red)
7-(CN70-9) Ice Solenoid/Valve (Prp–Red)

CN72 & CN79 120vac
1-(CN70-9) CR Room Lt (Wht-Red)
3-(CN70-9)CF Room Lt (Brn-Red)
5-(CN70-9) R Room Lt (Blu-Red)
7-(CN70-9) F Room Lt (Prp-Red)
11 Line N (Gry)
15- Htr Commons (Org)



CN70 120vac
1-(CN72-15) CR Def Htr (Blk-Org)
3-(CN72-15) CF Def Htr (Yel-Org)
5-(CN72-15) R Def & Drain Htr (Wht-Org)
7-(CN72-15) F Def & Drain Htr (Brn-Org)
9 Line1 (Red)

CN71 120vac
3-1 Dispenser Htr (W/Blk-Gry)
5-7 Home Bar Htr (Blu-Gry)

CN78
1 **+5 VDC** (Red)
3 **VDC GND** (Blk)
5 **+12 VDC** (Yel)

CN01
Gate Way

CN76
1 & 11 **+12 VDC** (Blk-S/Blu)
1-2 CF Fan Mtr (Blk-Brn) **7~12vdc**
3 CF Fan FG (Red)
1-4 Ice Pipe Heater (Blk-Org) **12vdc**
11-5 CR Fan Mtr (S/Blu-Yel) **7~12vdc**
6 CR Fan FG (Pnk)
11-10 H2O Tank Htr (S/Blu-Wht) **12vdc**

CN77
3-(CN74-7) Comp (Org-Gry) **2.5vdc**

CN50 Display
4-6 **+12 VDC** (Org-Pnk)
5-6 **+5 VDC** (Yel-Pnk)
8-7 Ice sw (Prp-Blu)
9-7 Water sw (Wht-Blu)
6 **vdc GND** (Pnk)

CN75
1 **+12 VDC** (Red)
2 Coil A (Blk)
3 Coil A Inverse (Yel)
4 Coil B (Org)
5 Coil B Inverse (Blu)

CN40
1-3 Cube Mtr Sw (Blk-Gry)
2 Home Bar Dr Sw (W/Red)

CN90 Ice Maker
1-2 I/M Motor (Red-Blk) **12vdc**
3-4 I/M Sensor (Wht-Wht) **2.1~3.7vdc**
5-8 Test Sw (Gry-S/Blu)
6-8 **+5 VDC** (Blu-S/Blu)
7 Hall IC Out (Prp)

CN74
1 C Fan FG (Red)
2 R Fan FG (Brn)
3 F Fan FG (Blk)
4-7 C Fan Mtr (S/Blu-Gry) **7~12vdc**
5-7 R Fan Mtr (Org-Gry) **7~12vdc**
6-7 F Fan Mtr (Yel-Gry) **7~12vdc**
7 **vdc GND** (Gry)

CN30

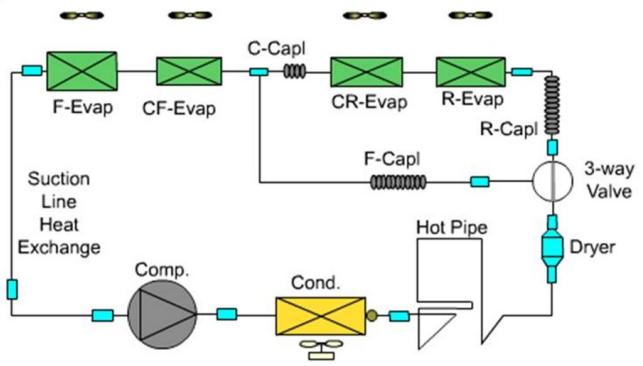
1-7 F Dr Sw (Blk-Gry)	2-7 CF Dr Sw (Brn-Gry)
3-7 F Sensor (Red-Gry) **3.5~4.2vdc**	4-7 F Def Sensor (Org-Gry) **2.3~4.2vdc**
5-7 CF Sensor (Yel-Gry) **2.7~4.05vdc**	6-7 CF Def Sensor (Pnk-Gry) **2.3~4.2vdc**
8-14 R Dr Sw (Prp-Gry)	9-14 CR Door Sw (Blu-Gry)
10-14 R Sensor (Wht-Gry) **2.4~2.8vdc**	11-14 R Def Sensor (S/Blu-Gry) **2~4.2vdc**
12-14 CR Sensor (W/Blk-Gry) **2.4~3.2vdc**	13-14 CR Def Sensor (W/Red-Gry) **2~4.2vdc**

Ext Sensor
read 7-8 of F Hinge connector **1.2~2 vdc**

Compressor & System Operation Testing

The Time Divided Multi-cycle (TDM) System (Stepper Valve) is used to switch refrigerant flow . This improves temperature control and energy efficiency.

If it fails in the all evaporator mode, it should work properly, using slightly more energy. If it fails in the Freezer evaporator only mode, there will be a Fridge no cool Force on the Fridge with the "Power Cool" option. Monitor the Fridge evaporator(s) temp by using the Defrost Sensor(s). If the temp doesn't decrease, then suspect the Main PCB is not supplying signal to switch the diverter valve.



TEST BEFORE INTERPRETING LED BLINKING FREQUENCY

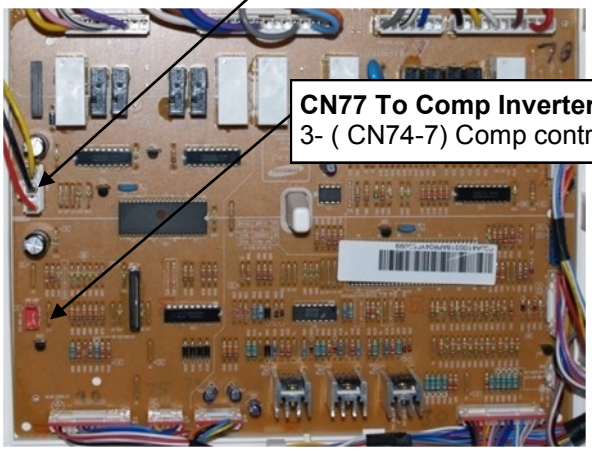
Compressor not running

1. Activate Forced Compressor Operation, wait 2 minutes (in case of high head pressure)
2. If compressor doesn't start, check CN75 for 2~2.8vdc (if not there replace Main PCB)
3. Check for 120vac to inverter PCB CN02 L-N
4. If voltage is OK, remove power, disconnect CN03 (Inverter PCB) and check resistance to the windings. Aproxametly10 ohms. If not correct , inspect wire harness, if OK replace compressor.
5. Disconnect CN02 (SMPS PCB), check resistance to Overload , if open replace overload.

CN78 To Comp Inverter Board
1 **+5 VDC** (Red)
3 **VDC GND** (Blk)
5 **+12 VDC** (Yel)

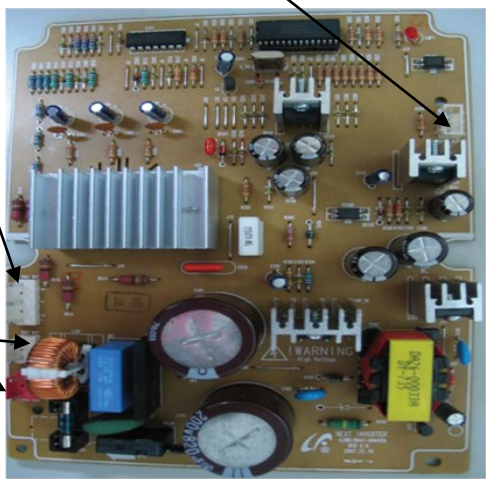
CN03 Compressor Windings
1 Compressor (Blue)
3 Compressor (Prp)
5 Compressor (Wht)

CN04 Compressor Control
1-3 12vdc
2-3 5vdc
3 vdc GND
4-3 Comp Signal (Org)

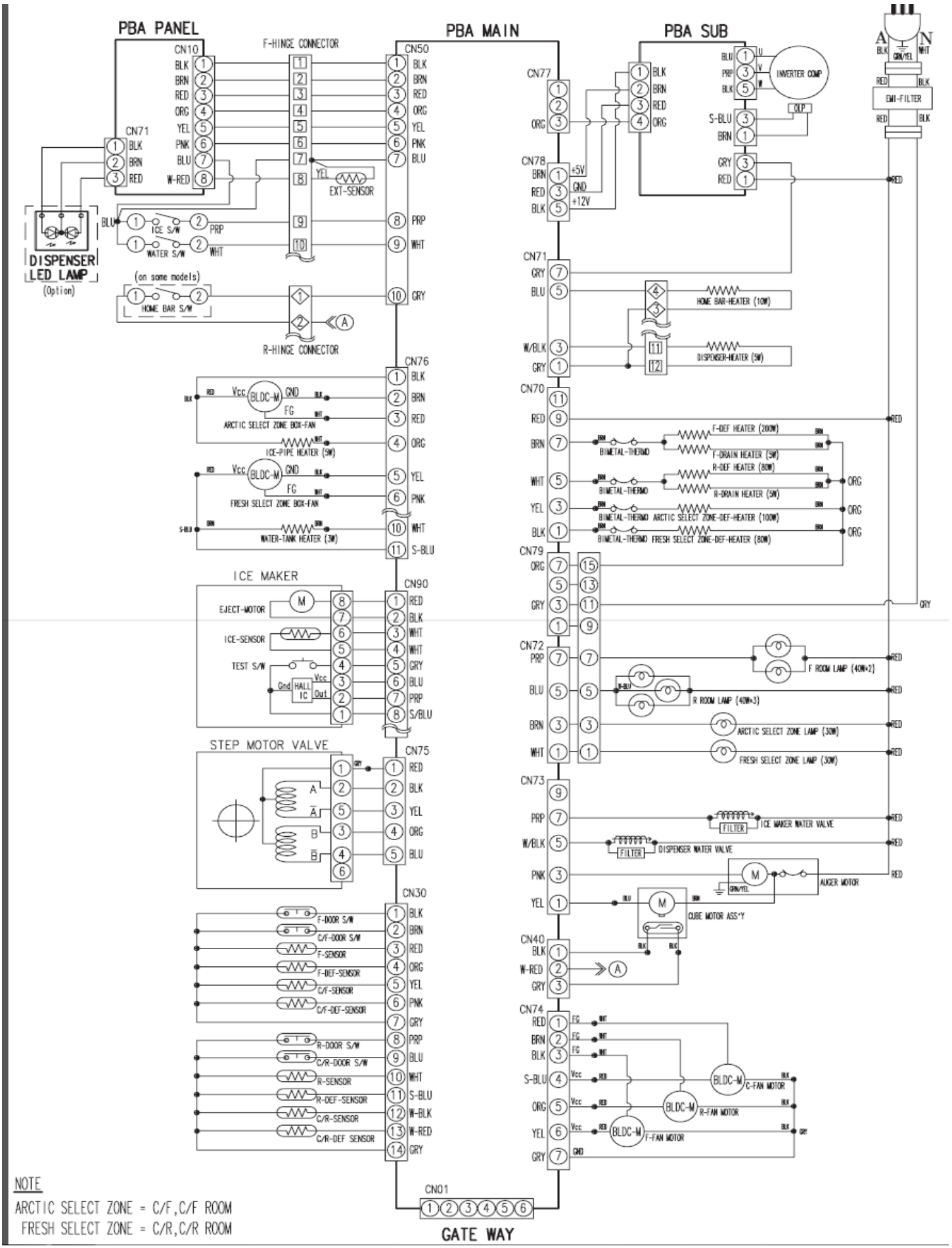


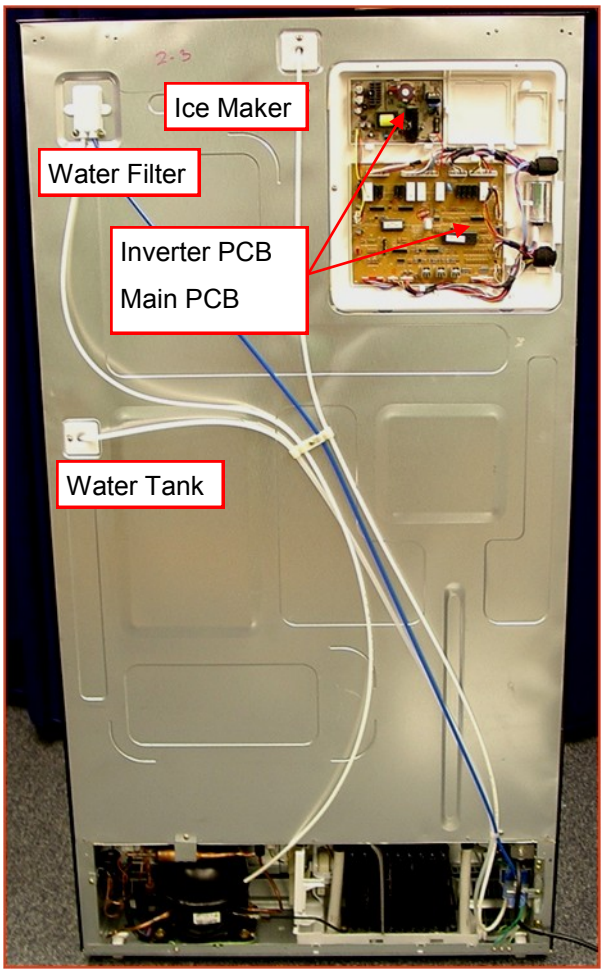
CN77 To Comp Inverter Board
3- (CN74-7) Comp control (Org-Gry) **2~2.8vdc**

CN02
Overload & A/C Line
1 OLP (Red)
3 OLP (S/Blu)
3 L (Red)
1 N (Gry)

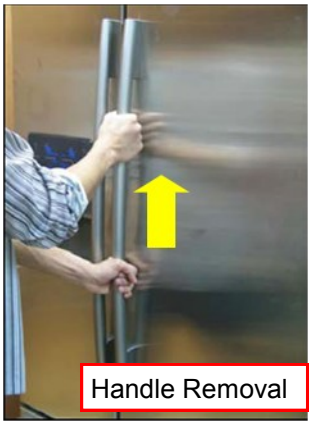


Protection Functions	LED Blinking Frequency	Test	Replace
Starting Failure	●	Check the Inverter PCB & Comp Relay Connectors	Connectors OK,replace Inverter PCB, if same, replace compressor
SPM Fault	● ●	If blinking after reset,	Check System for restriction & refrigerant, if OK replace Inverter, if same, replace compressor
Detecting Position Failure	● ● ●	Check Inverter Connectors,	Connectors measure OK, replace compressor, if same, replace Inverter PCB
Motor Locked	● ● ● ●	Compressor Locking	Compressor
Low Voltage	● ● ● ● ●	Compressor Locking, check input voltage	Replace Inverter PCB, if same, replace Compressor
Over Voltage	● ● ● ● ● ●	Compressor Locking, check input voltage	Replace Inverter PCB, if same, replace Compressor

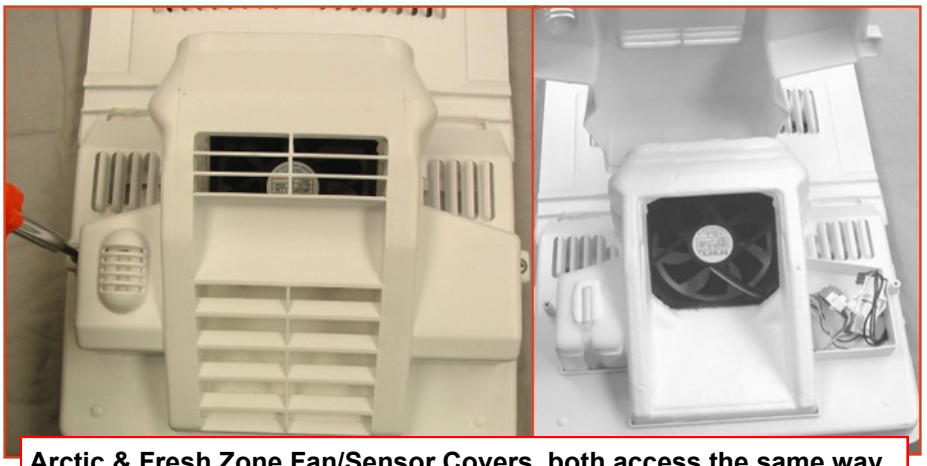

PBA PANEL
PBA MAIN
PBA SUB
F-HINGE CONNECTOR
CN10
CN71
CN50
CN77
CN78
CN76
CN90
CN75
CN30
CN40
CN74
CN70
CN79
CN72
CN73
CN01
DISPENSER LED LAMP
(Option)
ICE S/W
WATER S/W
(on some models)
HOME BAR S/W
EXT-SENSOR
R-HINGE CONNECTOR
ARCTIC SELECT ZONE BOX-FAN
ICE-PIPE HEATER (5W)
FRESH SELECT ZONE BOX-FAN
WATER-TANK HEATER (3W)
ICE MAKER
EJECT-MOTOR
ICE-SENSOR
TEST S/W
STEP MOTOR VALVE
F-DOOR S/W
C/F-DOOR S/W
F-SENSOR
F-DEF-SENSOR
C/F-SENSOR
C/F-DEF-SENSOR
R-DOOR S/W
C/R-DOOR S/W
R-SENSOR
R-DEF-SENSOR
C/R-SENSOR
C/R-DEF SENSOR
INVERTER COMP
OLP
EMI-FILTER
HOME BAR-HEATER (10W)
DISPENSER-HEATER (5W)
F-DEF HEATER (200W)
F-DRAIN HEATER (5W)
R-DEF HEATER (80W)
R-DRAIN HEATER (5W)
ARCTIC SELECT ZONE-DEF-HEATER (100W)
FRESH SELECT ZONE-DEF-HEATER (80W)
F ROOM LAMP (40W×2)
R ROOM LAMP (40W×3)
ARCTIC SELECT ZONE LAMP (30W)
FRESH SELECT ZONE LAMP (30W)
ICE MAKER WATER VALVE
DISPENSER WATER VALVE
AUGER MOTOR
CUBE MOTOR ASS'Y
C-FAN MOTOR
R-FAN MOTOR
F-FAN MOTOR
GATE WAY
NOTE
ARCTIC SELECT ZONE = C/F,C/F ROOM
FRESH SELECT ZONE = C/R,C/R ROOM



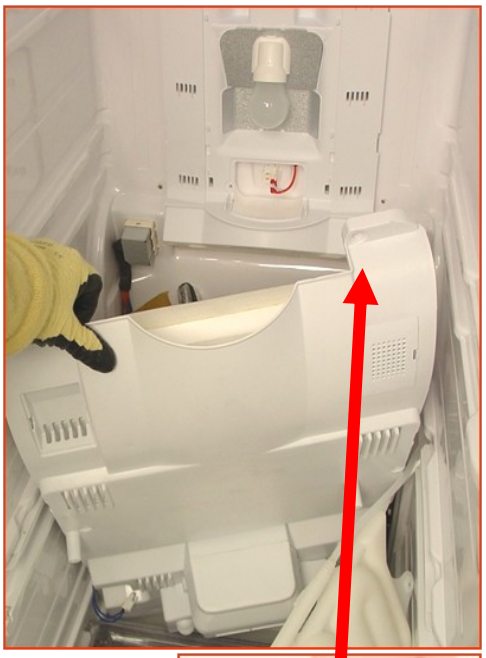
Insert flat blade screwdriver in the slot shown and unlock the tabs

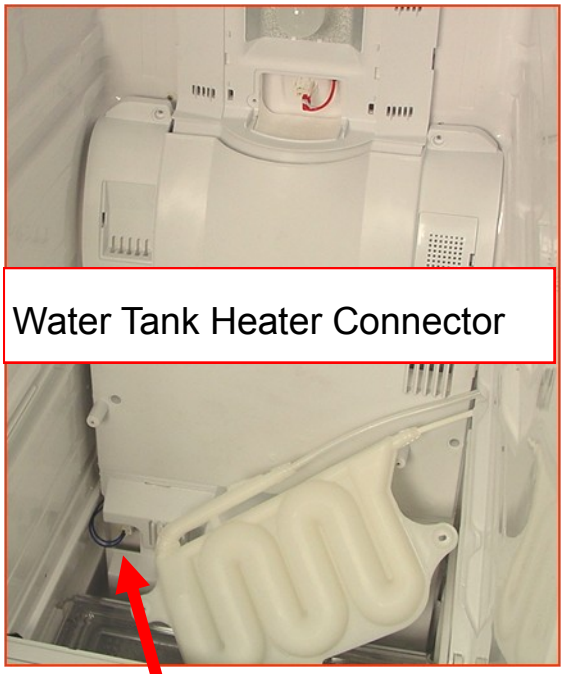


Disassembly of Quatro Cool Compartment Floors, both access the same way



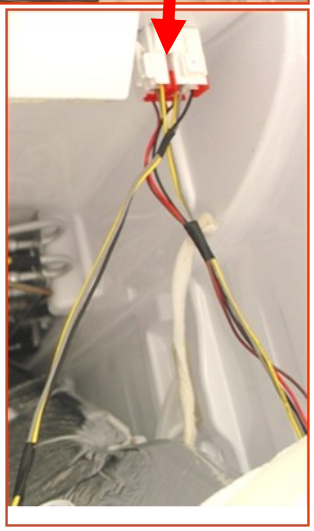
Arctic & Fresh Zone Fan/Sensor Covers, both access the same way



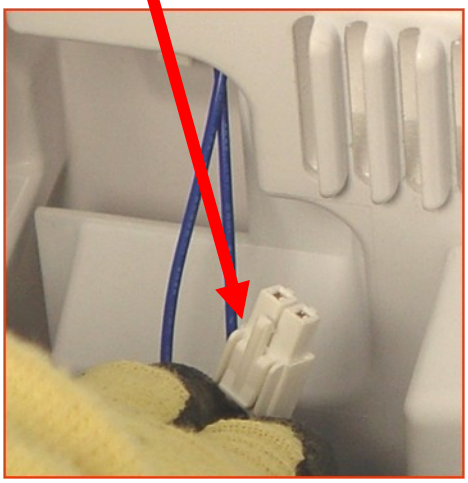


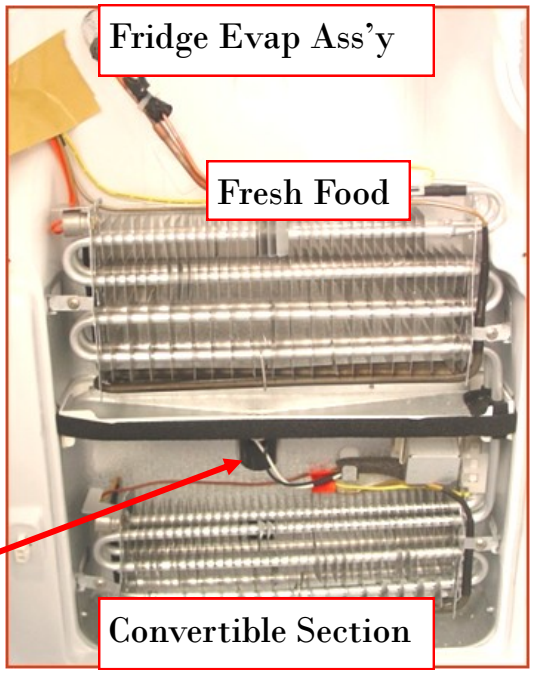
Water Tank Heater Connector

Pull cover up and out far enough to unplug wire harnesses Remember to lock in bottom first when reinstalling

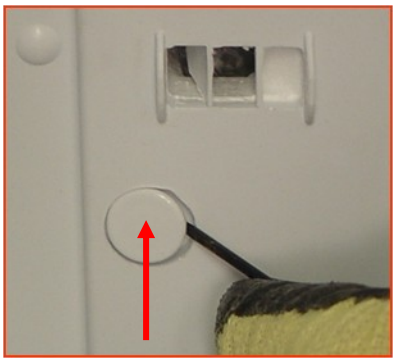


Fresh Food Compartment

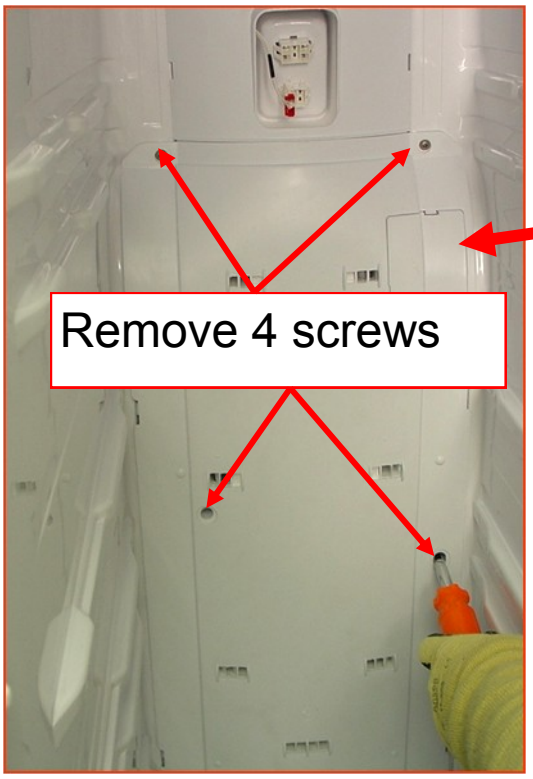




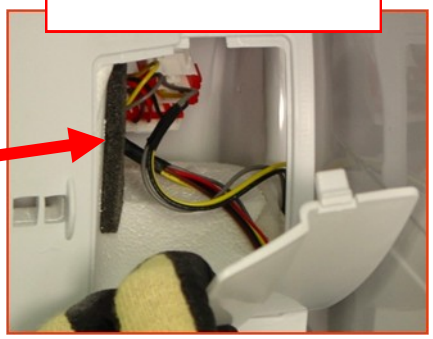
Failure of the Drain Hose Heater could cause water build up on fridge floor and cooling issues



Remove screw caps



Snap off cover



Unplug wire harnesses

Freezer Compartment

Failure of the Defrost Drain Hose Heater could cause ice build up on freezer floor and cooling issues in Freezer and/or Arctic Zone